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10/633,573

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Jong-Chull Shon

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EXAMINER

LEE, WILSON

ART UNIT

PAPER NUMBER

2821

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/633,573

Applicant(s)

SHON ET AL.

Examiner

Wilson Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 29-38 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/5/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: Front page of Tsuzurahara.

Response to Arguments on Restriction Requirement

Upon further consideration, Group II are examined together with Group I since Examiner found a reference in a search disclosing a magnetron can be used in microwave oven as shown in Group II. Group I is currently seen as a magnetron of a microwave oven. However, Group III discloses a particular function such as rendering high frequency particle beam in a particle accelerator unit that is quite different from a microwave oven. The burden for searching a magnetron being used in particle accelerator does exist since microwave oven and particle accelerator are not related. Examination on Group III has to be done on a separate search. Should applicant traverse on the ground of restriction, applicant is respectfully requested to provide reasons why microwave oven and high frequency particle accelerator are related each other and they can be classified in a same category.

Moreover, the issue of burden merely plays a minor role for the basis to support the restriction requirement. Since it has been concluded that the pending application includes more than one separate distinctive and independent invention, the restriction is therefore proper.

In particular, it appears that applicant believes the issue of burden only arises from the search of prior art and examination of the application in determining the patentability of the claimed invention. However, applicant is respectfully reminded that conducting a search on application merely plays a small part of examining the invention. Burden may also arise from prosecuting multiple inventions in a single application. Such a type prosecution merely leads to complication in patentability determination that may

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ultimately sacrifices the quality of patentability determination. In view of this reason, a restriction imposed is clearly proper.

The requirement is still deemed proper and is therefore made **FINAL**.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Claim Rejections – 35 U.S.C. 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-13, 17-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsuzurahara (4,426,601).

Regarding Claim 1, Tsuzurahara (See labeled figure) discloses a magnetron, comprising:

- a ring-shaped (e.g. cylindrical) anode (2) forming a plurality of resonance circuits (resonant cavities) (See Col. 1, lines 35-37),
- a cathode (1) disposed at an axial center of the anode (2) to emit thermions (See Col. 1, line 37), separated from the anode (2) by a predetermined space;

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- at least one permanent magnet (5a, 5b) provided beside the anode (2); and
- a magnetic flux carrying unit (3a, 3b) to carry magnetic flux (See Col. 1, lines 64-68) generated by the at least one permanent magnet (5a, 5b) to the predetermined space (space as labeled in examiner).

Regarding Claim 2, Tsuzurahara (See labeled figure) discloses that the at least one permanent magnet (5a) is spaced apart from the anode (2) by a predetermined interval (labeled by examiner).

Regarding Claim 3, Tsuzurahara (See labeled figure) discloses that the magnetic flux carrying unit (3a, 3b) comprises an upper magnetic flux carrying unit (3a) carrying the magnetic flux to an upper portion of the predetermined space and a lower magnetic flux carrying unit (3b) carrying the magnetic flux to a lower portion of the predetermined space.

Regarding Claim 4, Tsuzurahara (See labeled figure) discloses that the at least one permanent magnet (5a, 5b), the upper magnetic flux carrying unit (3a) and the lower magnetic flux carrying unit (3b) form a closed magnetic circuit in a normal order thereof (See Col. 1, lines 50-54).

Regarding Claim 5, Tsuzurahara (See labeled figure) discloses that the upper magnetic flux carrying unit (3a) comprises an upper pole piece carrying the magnetic flux to the upper portion of the predetermined space (Upper portion. See labeled figure) and an upper yoke (6a) magnetically connecting the permanent magnets (5a) with the upper pole piece (3a); and the lower magnetic flux carrying unit (3a) comprises a lower pole piece carrying the magnetic flux to the lower portion of the predetermined space

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(Lower portion) and a lower yoke (6b) magnetically connecting the permanent magnets (5b) with the lower pole piece (3b).

Regarding Claim 6, Tsuzarahara (See labeled figure) discloses that the at least one permanent magnet (5a, 5b), the upper yoke (6a), the upper pole piece (3a), the lower pole piece (3b) and the lower yoke (6b) form a closed magnetic circuit in a normal order thereof (See Col. 1, lines 50-54).

Regarding Claim 7, Tsuzarahara (See labeled figure) discloses a magnetron, comprising:

- a ring-shaped (e.g. cylindrical) anode (2) forming a plurality of resonance circuits (See Col. 1, lines 35-40),
- a cathode (1) disposed at an axial center of the anode (2) to emit thermions (See Figure 2 and Col. 1, line 37), separated from the anode (2) by a predetermined space,
- at least one permanent magnet (5a, 5b) generating magnetic flux to be applied to the predetermined space;
- upper and lower pole pieces (3a, 3b) carrying the magnetic flux to upper and lower portions of the predetermined space, respectively; and
- upper and lower yokes (6a, 6b) magnetically connecting the permanent magnets (5a, 5b) with the upper and lower pole pieces (3a, 3b), respectively;
- wherein the at least one permanent magnet (5a, 5b), the upper yoke (6a), the upper pole piece (3a), the lower pole piece (3b), and the lower yoke (6b) form a closed magnetic circuit in a normal order thereof (See Col. 1, lines 50-54).

Regarding Claim 8, Tsuzurahara (See labeled figure) discloses that the at least one permanent magnet (5a) is spaced apart from the anode (2) by a predetermined interval (labeled by examiner).

Regarding Claim 9, Tsuzurahara (See labeled figure) discloses a magnetron, comprising:

- a ring-shaped (e.g. cylindrical) anode (2) forming a plurality of resonance circuits (See Col. 1, lines 35-40);
- a cathode (1) disposed at an axial center of the anode to emit thermions (See Col. 1, line 37), separated from the anode (2) by a predetermined space;
- at least one permanent magnet (5a, 5b) provided beside the anode (2) and spaced therefrom by a predetermined interval to generate magnetic flux to be applied to the predetermined space; and
- a magnetic flux carrying unit (6a, 6b) to carry magnetic flux generated by the at least one permanent magnet (5a, 5b) to the predetermined space.

Regarding Claim 10, Tsuzurahara (See labeled figure) discloses that the magnetic flux carrying unit comprises an upper magnetic flux carrying unit (3a) carrying the magnetic flux to an upper portion of the predetermined space and a lower magnetic flux carrying unit (3b) carrying the magnetic flux to a lower portion of the predetermined space.

Regarding Claim 11, Tsuzurahara (See labeled figure) discloses that

- the upper magnetic flux carrying unit (3a) comprises an upper pole piece carrying the magnetic flux to the upper portion of the predetermined space

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and an upper yoke (6a) magnetically connecting the permanent magnets (5a, 5b) with the upper pole piece; and

- the lower magnetic flux carrying unit (3b) comprises a lower pole piece carrying the magnetic flux to the lower portion of the predetermined space and a lower yoke (6b) magnetically connecting the permanent magnets (5a, 5b) with the lower pole piece.

Regarding Claim 12, Tsuzurahara (See labeled figure) discloses a magnetron, comprising:

- a ring-shaped (e.g. cylindrical) anode (2) forming a plurality of resonance circuits (resonant cavities) (See Col. 1, lines 35-37);
- a cathode (1) disposed at an axial center of the anode (2) to emit thermions (See Col. 1, lines 36-38), separated from the anode (2) by a predetermined space;
- at least one permanent magnet (5a, 5b) provided beside the anode (2);
- upper and lower pole pieces (3a, 3b) carrying the magnetic flux generated by the permanent magnets (5a, 5b) to upper and lower portions of the predetermined space, respectively;
- upper and lower yokes (6a, 6b) magnetically connecting the at least one permanent magnet (5a, 5b) with the upper and lower pole pieces (3a, 3b), respectively, and covering tops and bottoms of the permanent magnets (5a, 5b), respectively, and

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- an attaching unit (screw bolts) to attach the permanent magnets (5a, 5b) to the upper and lower yokes (6a, 6b) (See Col. 1, lines 48-54).

Regarding Claim 13, Tsuzurahara (See labeled figure) discloses that the attaching unit comprises:

- attaching holes (it is an inherent feature since screw bolts must work with holes in order to tighten two separate means) formed in the upper and lower yokes (6a, 6b), respectively through holes formed in the permanent magnets (5a, 5b), respectively; and
- bolts adapted to attach the permanent magnets (5a, 5b) to the upper and lower yokes (6a, 6b) while passing through the attaching and through holes (it is an inherent feature since screw bolts must work with holes in order to tighten two separate means)

Regarding Claim 17, Tsuzurahara (See labeled figure) discloses that the at least one permanent magnet (5a, 5b) has an outside surface that coincides with radially outer ends of the upper and lower yokes (6a, 6b).

Regarding Claim 18, Tsuzurahara (See labeled figure) discloses that the at least one permanent magnet (6a) has a polarization direction parallel with the axial center direction (See labeled figure).

Regarding Claim 19, Tsuzurahara (See labeled figure) discloses that the at least one permanent magnet comprises a plurality of magnets (5a, 5b) that have a same polarization direction.

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Regarding Claim 20, Tsuzurahara (See labeled figure) discloses a magnetron, comprising:

- a ring-shaped (e.g. cylindrical) anode (2) forming a plurality of resonance circuits (resonant cavities) (See Col. 1, lines 35-37),
- a cathode (1) disposed at an axial center of the anode (2) to emit thermions (See Col. 1, line 37), separated from the anode by a predetermined space (space 3);
- at least one permanent magnet (5a, 5b) provided beside the anode (2) to be longer than the anode (2) in an axial center direction of the magnetron; and
- a magnetic flux unit (3a, 3b) to carry magnetic flux generated by the at least one permanent magnet (5a, 5b) to the predetermined space.

Regarding Claim 21, Tsuzurahara (See labeled figure) discloses that the magnetic flux carrying unit (3a, 3b) comprises an upper magnetic flux carrying unit (3a) carrying the magnetic flux to an upper portion of the predetermined space (space) and a lower magnetic flux carrying unit (3b) carrying the magnetic flux to a lower portion of the predetermined space (space 3).

Regarding Claim 22, Tsuzurahara (See labeled figure) discloses that

- the upper magnetic flux carrying unit (3a) comprises an upper pole piece carrying the magnetic flux to the upper portion of the predetermined space and an upper yoke (6a) magnetically connecting the at least one permanent magnet (5a) with the upper pole piece (3a), and

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- the lower magnetic flux carrying unit (3b) comprises a lower pole piece carrying the magnetic flux to the lower portion of the predetermined space and a lower yoke (6b) magnetically connecting the at least one permanent magnet (5b) with the lower pole piece (3b).

Claim Rejections – 35 U.S.C. 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuzurahara (4,426,601).

Regarding Claim 14, as discussed above, Tsuzurahara essentially discloses the claimed invention but does not explicitly disclose that the screw bolt are made of non-magnetic or paramagnetic material. However, it would have been obvious to one of ordinary skill in the art to provide non-magnetic material bolt in Tsuzurahara in order to tighten magnet to the yoke because non-magnetic material is stronger than magnetic material or magnet.

Regarding Claim 15, as discussed above, Tsuzurahara essentially discloses the claimed invention but does not explicitly disclose that the paramagnetic material is aluminum or Copper. However, it is well known to a skilled in the art most of screw bolts including Tsuzurahara's are made of either Aluminum or Copper since these materials are widely and commonly used in industry.

Regarding Claim 16, Tsuzurahara discloses that the upper yoke (6a) is provided at one or more side ends thereof with at least one mounting tab (screw bolt) that protrudes outside outer surfaces of the at least one permanent magnet (5a), to be used to attach the magnetron to any object (See Col. 1, lines 48-54).

Claims 23-28 (group II) are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuzurahara (4,426,601) in view of Seong (5,541,391).

Regarding Claims 23-28, as discussed, Tsuzurahara discloses the structure of the claimed magnetron but does not explicitly disclose a cooking cavity and a control unit. Seong discloses a microwave oven comprising a magnetron (20), a cooking cavity (50) and a control unit to control an amount of heat produced by the heating unit (e.g. magnetron) (See Figure 1). On the other hand, Tsuzurahara teaches that his magnetron can be operated with a microwave oven (See Col. 2, lines 20-25). It would have been obvious to one of ordinary skill in the art to use Tsuzurahara's magnetron in a microwave oven system as implied by Tsuzurahara being operated with the common circuit elements found in any microwave oven as shown in Seong in order to produce heat from the magnetron to cook food in a cavity.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ogura et al. (6,653,788) discloses a magnetron having a lowered oscillation frequency and processing equipment. Tsuzurahara (4,445,873) discloses a method of producing magnetrons. Kumpfer, deceased et al. (4,310,786) discloses a

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magnetron tube with improved low cost structure. Koinuma et al. (4,204,138) discloses a permanent magnet-containing magnetron.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Wilson Lee whose telephone number is (571) 272-1824.

Papers related to Technology Center 2800 applications may be submitted to Technology Center 2800 by facsimile transmission. Any transmission not to be considered an official response must be clearly marked "DRAFT". The official fax number is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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3/15/05